

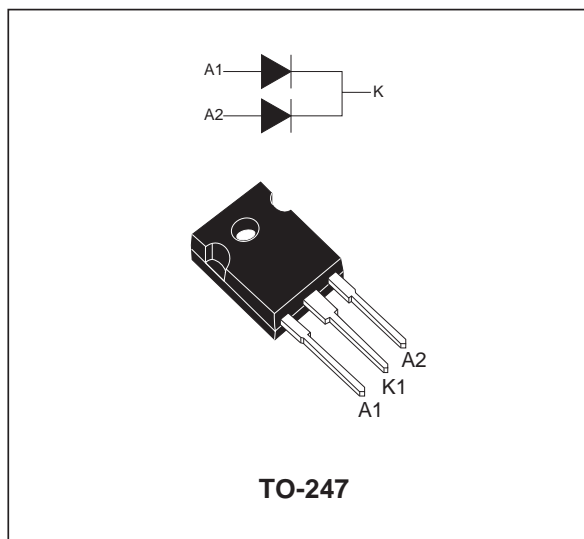
HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

| | |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 20 A |
| V_{RRM} | 100 V |
| T_j (max) | 175 °C |
| V_F (max) | 0.61 V |

FEATURES AND BENEFITS

- NEGLIGIBLE SWITCHING LOSSES
- LOW LEAKAGE CURRENT
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED



DESCRIPTION

Dual center tap Schottky rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-247, this device is intended for use in high frequency inverters.

ABSOLUTE RATINGS (limiting values, per diode)

| Symbol | Parameter | | | Value | Unit |
|--------------|--|--|-------------------------|---------------|------------------|
| V_{RRM} | Repetitive peak reverse voltage | | | 100 | V |
| $I_{F(RMS)}$ | RMS forward current | | | 30 | A |
| $I_{F(AV)}$ | Average forward current | $T_c = 160^\circ\text{C}$ $\delta = 0.5$ | Per diode Per device | 20 40 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10\text{ ms}$ sinusoidal | | 300 | A |
| I_{RRM} | Repetitive peak reverse current | $t_p = 2\text{ }\mu\text{s}$ $F = 1\text{ kHz}$ square | | 1 | A |
| I_{RSM} | Non repetitive peak reverse current | $t_p = 100\text{ }\mu\text{s}$ square | | 4 | A |
| E_{AS} | Non repetitive avalanche energy | $T_j = 25^\circ\text{C}$ $L = 60\text{ mH}$ $I_{as} = 3\text{ A}$ | | 36 | mJ |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1\text{ }\mu\text{s}$ $T_j = 25^\circ\text{C}$ | | 26400 | W |
| T_{stg} | Storage temperature range | | | - 65 to + 175 | °C |
| T_j | Maximum operating junction temperature | | | 175 | °C |
| dV/dt | Critical rate of rise of rise voltage | | | 10000 | V/ μs |

STPS40H100CW

THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---------------|------------------|-----------|-------|----------------------|
| $R_{th(j-c)}$ | Junction to case | Per diode | 0.9 | $^{\circ}\text{C/W}$ |
| | | Total | 0.55 | |
| $R_{th(c)}$ | Coupling | | 0.1 | |

When the diodes 1 and 2 are used simultaneously :

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|------------|-------------------------|-----------------------------|---------------------|------|------|------|---------------|
| I_R^* | Reverse leakage current | $T_j = 25^{\circ}\text{C}$ | $V_R = V_{RRM}$ | | | 10 | μA |
| | | $T_j = 125^{\circ}\text{C}$ | | | 5 | 15 | mA |
| V_F^{**} | Forward voltage drop | $T_j = 25^{\circ}\text{C}$ | $I_F = 20\text{ A}$ | | | 0.73 | V |
| | | $T_j = 125^{\circ}\text{C}$ | $I_F = 20\text{ A}$ | | 0.58 | 0.61 | |
| | | $T_j = 25^{\circ}\text{C}$ | $I_F = 40\text{ A}$ | | | 0.85 | |
| | | $T_j = 125^{\circ}\text{C}$ | $I_F = 40\text{ A}$ | | 0.67 | 0.72 | |

Pulse test : * $t_p = 5\text{ ms}$, $\delta < 2\%$

** $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :

$$P = 0.5 \times I_{F(AV)} + 0.0055 \times I_{F(RMS)}^2$$

Fig. 1: Average forward power dissipation versus average forward current (per diode).

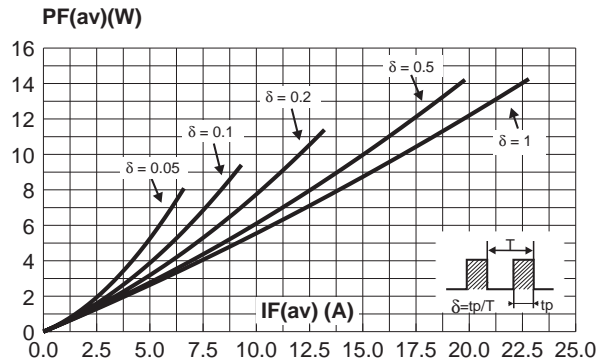


Fig. 3: Normalized avalanche power derating versus pulse duration.

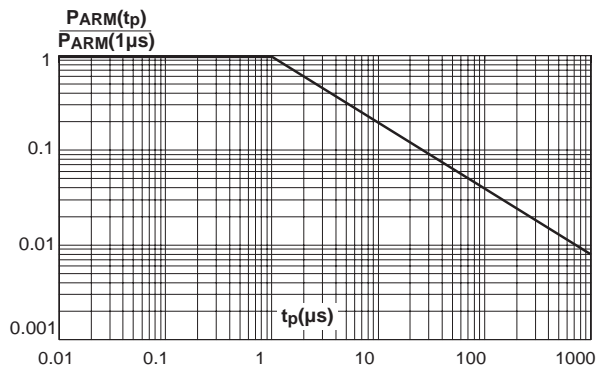


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$, per diode).

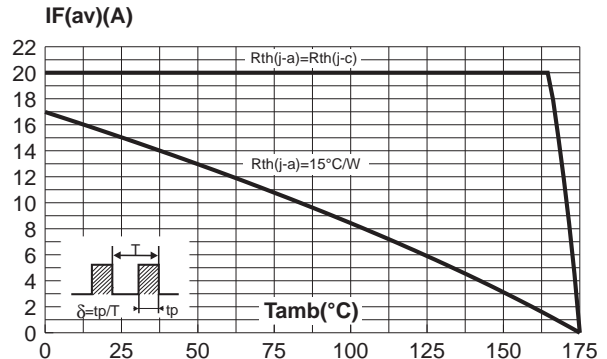


Fig. 4: Normalized avalanche power derating versus junction temperature.

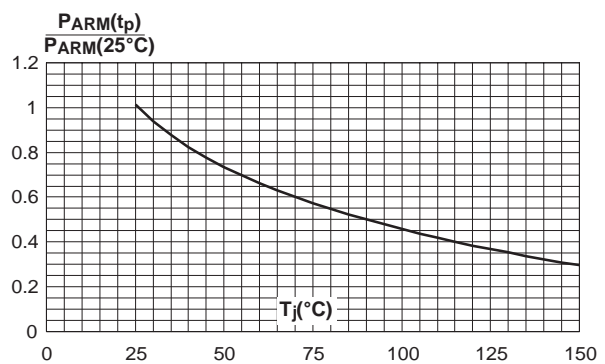


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode).

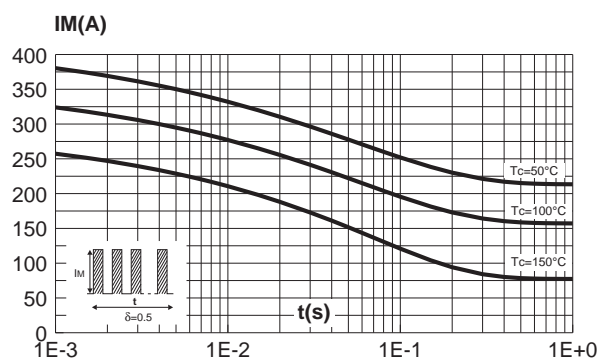


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

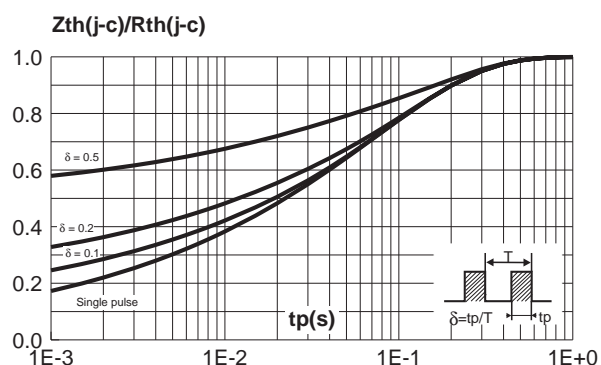


Fig. 7: Reverse leakage current versus reverse voltage applied (maximum values, per diode).

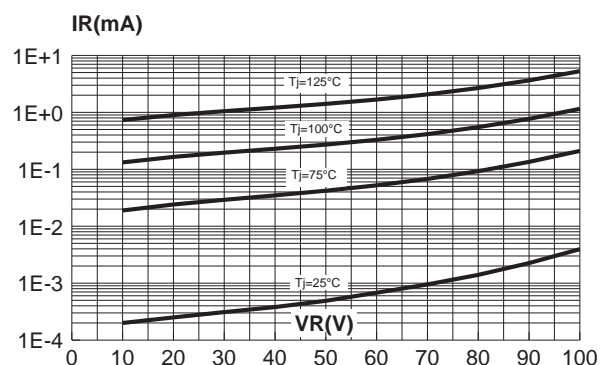


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

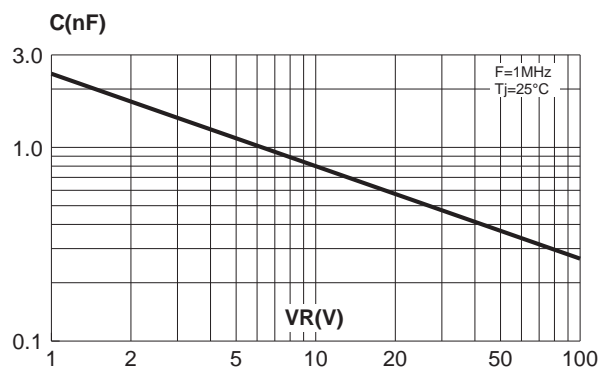
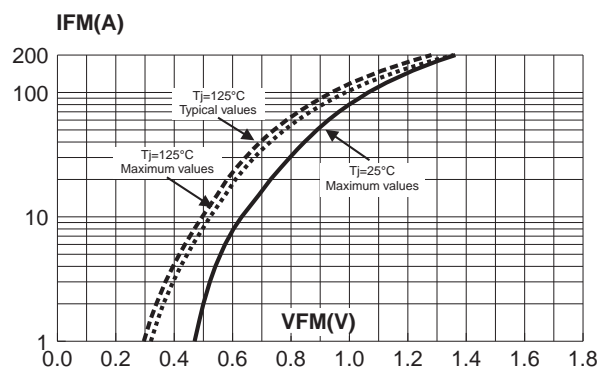


Fig. 9: Forward voltage drop versus forward current (per diode).



STPS40H100CW

PACKAGE MECHANICAL DATA

TO-247

| REF. | DIMENSIONS | | | | | |
|------|-------------|-------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.85 | | 5.15 | 0.191 | | 0.203 |
| D | 2.20 | | 2.60 | 0.086 | | 0.102 |
| E | 0.40 | | 0.80 | 0.015 | | 0.031 |
| F | 1.00 | | 1.40 | 0.039 | | 0.055 |
| F1 | | 3.00 | | | 0.118 | |
| F2 | | 2.00 | | | 0.078 | |
| F3 | 2.00 | | 2.40 | 0.078 | | 0.094 |
| F4 | 3.00 | | 3.40 | 0.118 | | 0.133 |
| G | | 10.90 | | | 0.429 | |
| H | 15.45 | | 15.75 | 0.608 | | 0.620 |
| L | 19.85 | | 20.15 | 0.781 | | 0.793 |
| L1 | 3.70 | | 4.30 | 0.145 | | 0.169 |
| L2 | | 18.50 | | | 0.728 | |
| L3 | 14.20 | | 14.80 | 0.559 | | 0.582 |
| L4 | | 34.60 | | | 1.362 | |
| L5 | | 5.50 | | | 0.216 | |
| M | 2.00 | | 3.00 | 0.078 | | 0.118 |
| V | | 5° | | | 5° | |
| V2 | | 60° | | | 60° | |
| Dia. | 3.55 | | 3.65 | 0.139 | | 0.143 |

- Cooling method: C
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1 N.m.

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|--------------|---------|--------|----------|---------------|
| STPS40H100CW | STPS40H100CW | TO-247 | 4.36g | 30 | Tube |

- Epoxy meets UL94,V0

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